

## SEQUENCE LISTING

<110> Breitling, Frank  
 <120> SELECTION OF MONOCLONAL ANTIBODIES  
 <130> 4121-126  
 <140> US 09/889,182  
 <141> 2000-01-11  
 <150> PCT/DE00/00079  
 <151> 2000-01-11  
 <160> 6  
 <170> PatentIn version 3.1  
 <210> 1  
 <211> 5732  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic sequence  
 <400> 1  
 gcgcgcgttg acattgatta ttgactagtt attaatagta atcaattacg gggtcattag 60  
 ttcatagccc atatatggag ttccgcgtta cataacttac ggtaaatggc ccgcctggct 120  
 gaccgcccac cgacccccgc ccattgacgt caataatgac gtatgttccc atagtaacgc 180  
 caatagggac tttccattga cgtcaatggg tggactatgt acggtaaact gccacttgg 240  
 cagtacatca agtgtatcat atgccaagta cgtcccttat tgacgtcaat gacggtaa 300  
 ggcccgcctg gcattatgcc cagtacatga ctttatggga ctttctact tggcagtaca 360  
 tctacgtatt agtcatcgct attaccatgg tgaatgcgtt ttggcagtag atcaatgggc 420  
 gtggatagcg gtttgactca cggggatttc caagtctcca cccattgac gtcaatggga 480  
 gtttgttttg gcacaaaaat caacgggact ttccaaaatg tcgtaacaac tccgccccat 540  
 tgacgcaaat gggcggtagg cgtgtacggg gggagggtcta tataagcaga gctctctggc 600  
 taactagaga acccactgct tactggctta tcgaaattaa tacgactcac tatagggaga 660  
 cccaagcttg gtaccgagct cggatccact agtaacggcc gccagtgtgc tggaattcgg 720  
 cttggggata tccaccatgg agacagacac actcctgcta tgggtactgc tgctctgggt 780  
 tccagggtcc actggtgact atccatatga tgttcagat tatgctgggg cccaaaagcc 840  
 cgagggtgatc gatgccagcg agctgacccc cgccgtgacc acctacaagc tagtgatcaa 900  
 cggcaagacc ctgaaggcg agaccaccac cgaggccgtg gacgccgcca ccgcggagaa 960  
 ggtgttcaaa caatacgcta atgacaacgg ggtcgacggc gagtggactt acgacgacgc 1020  
 caccaagacc ttcaccgtga ccgagaagcc cgagggtgatc gatgccagcg agctgacccc 1080  
 cgccgtgacc acctacaagc tagtgatcaa cggcaagacc ctgaaggcg agaccaccac 1140  
 cgaggccgtg gacgccgcca ccgcggagaa ggtgttcaaa caatacgcta atgacaacgg 1200  
 ggtcgacggc gagtggactt acgacgacgc caccaagacc ttcaccgtga ccgaggcgcc 1260

## 4121-126.ST25

cgcagaacaa aaactcatct cagaagagga tctgaatggg gccgtcgacg gacaaaacga 1320  
 caccagccaa accagcagcc cctcagcatc cagcaacata agcggaggca ttttcctttt 1380  
 cttcgtggcc aatgccataa tccacctctt ctgcttcagt tgaggtagaca cgtctagagc 1440  
 tattctatag tgtcacctaa atgctagagc tcgctgatca gcctcgactg tgccttctag 1500  
 ttgccagcca tctgttgttt gccccctccc cgtgccttcc ttgaccctgg aagggtgccac 1560  
 tcccactgtc ctttcctaataaaaatgagga aattgcatcg cattgtctga gtaggtgtca 1620  
 ttctattctg ggggggtggg tggggcagga cagcaagggg gaggattggg aagacaatag 1680  
 caggcatgct ggggatgcgg tgggctctat ggcttctgag gcggaagaa ccagtggcgg 1740  
 taatacgggt atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc 1800  
 agcaaaaggc caggaaccgt aaaaaggccg cgttgcctggc gtttttccat aggtccgcc 1860  
 cccctgacga gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac 1920  
 tataaagata ccaggcgttt cccctggaa gctccctcgt gcgctctcct gttccgaccc 1980  
 tgccgcttac cgataacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata 2040  
 gctcacgctg taggtatctc agttcgggtg aggtcgttcg ctccaagctg ggctgtgtgc 2100  
 acgaaccccc cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca 2160  
 acccggaag acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag 2220  
 cgaggatgt aggcgggtct acagagtctt tgaagtgggt gcctaactac ggctacacta 2280  
 gaaggacagt atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg 2340  
 gtagctcttg atccggcaaa caaacaccg ctggtagcgg tggttttttt gtttgcaagc 2400  
 agcagattac gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt 2460  
 ctgacgctca gtggaacgaa aactcacgtt aagggtttt ggtcatgaga ttatcaaaaa 2520  
 ggatcttcac ctatagctct ttaaattaaa aatgaagttt taaatcaatc taaagtatat 2580  
 atgagtaacc tgaggctatg gcagggcctg ccgccccgac gttggctgcg agccctgggc 2640  
 cttcaccgga acttgggggg tgggggtggg aaaaggaaga aacgcgggcg tattggcccc 2700  
 aatgggggtc cggtggggta tcgacagagt gccagccctg ggaccgaacc ccgcgtttat 2760  
 gaacaaacga cccaacaccg tgcgttttat tctgtctttt tattgccgtc atagcgcggg 2820  
 ttccctccgg tattgtctcc ttccgtgttt cagttagcct ccccttaggg tggcggaaga 2880  
 actccagcat gagatccccg cgctggagga tcatccagcc ggcgtccccg aaaacgattc 2940  
 cgaagcccaa ctttcatag aaggcggcgg tggaatcgaa atctcgtgat ggcagggttg 3000  
 gcgtcgcttg gtcggtcatt tcgaacccca gagtcccgtc cagaagaact cgtcaagaag 3060  
 gcgatagaag gcgatgcgct gcgaatcggg agcggcgata ccgtaaagca cgaggaagcg 3120  
 gtcagcccat tcgcccga aa gctcttcagc aatatcacgg gttagccaacg ctatgtcctg 3180  
 atagcgggtc gccacacca gccggccaca gtcgatgaat ccagaaaagc ggccattttc 3240  
 caccatgata ttcggcaagc aggcacgccc atgggtcacg acgagatcct cgcgctcggg 3300  
 catgctcgcc ttgagcctgg cgaacagttc ggctggcgcg agcccctgat gctcttgatc 3360

## 4121-126.ST25

atcctgatcg acaagaccgg cttccatccg agtacgtgct cgctcgatgc gatgtttcgc 3420  
 ttggtggtcg aatgggcagg tagccggatc aagcgtatgc agccgccgca ttgcatcagc 3480  
 catgatggat actttctcgg caggagcaag gtgagatgac aggagatcct gccccggcac 3540  
 ttcgccaat agcagccagt cctttccgc ttcagtgaca acgtcgagca cagctgcgca 3600  
 aggaacgccc gtcgtggcca gccacgatag ccgcgtgcc tcgtcttgca gttcattcag 3660  
 ggcaccggac aggtcggctc tgacaaaaag aaccgggcgc ccctgcgtg acagccggaa 3720  
 cacggcgga tcagagcagc cgattgtctg ttgtgcccag tcatagccga atagcctctc 3780  
 caccgaagcg gccggagaac ctgctgcaa tccatcttgt tcaatcatgc gaaacgatcc 3840  
 tcactctgtc tcttgatcga tctttgcaa agcctaggcc tccaaaaaag cctcctcact 3900  
 acttctggaa tagctcagag gccgaggagg cggcctcggc ctctgcataa ataaaaaaaa 3960  
 ttagtcagcc atggggcgga gaatgggcgg aactgggcgg agttaggggc gggatgggcg 4020  
 gagttagggg cgggactatg gttgctgact aattgagatg catgctttgc atacttctgc 4080  
 ctgctgggga gcctggggac tttccacacc tgggtgctga ctaattgaga tgcattgctt 4140  
 gcatacttct gcctgctggg gagcctgggg actttccaca ccctaactga cacacattcc 4200  
 acagctgggt ctttccgcct caggactctt cctttttcaa taaatcaatc taaagtatat 4260  
 atgagtaaac ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga 4320  
 tctgtctatt tcgttcatcc atagtgcct gactccccgt cgtgtagata actacgatac 4380  
 gggagggctt accatctggc ccagtgctg caatgatacc gcgagacca cgctcaccgg 4440  
 ctccagatth atcagcaata aaccagccag ccggaaggcg cgagcgaga agtggctctg 4500  
 caactttatc cgcctccatc cagtctatta attgttgccg ggaagctaga gtaagtagtt 4560  
 cgccagttaa tagtttgccg aacgttggtt ccattgctac aggcacgtg gtgtcacgct 4620  
 cgctgtttgg tatggcttca ttcagctccg gttcccaacg atcaaggcga gttacatgat 4680  
 cccccatgtt gtgcaaaaaa gcggttagct ccttcgggtc tccgatcgtt gtcagaagta 4740  
 agttggccgc agtgttatca ctcatgggta tggcagcact gcataattct cttactgtca 4800  
 tgccatccgt aagatgcttt tctgtgactg gtgagtactc aaccaagtca ttctgagaat 4860  
 agtgtatgcg gcgaccgagt tgctcttgcc cggcgtaac acgggataat accgcgccac 4920  
 atagcagaac tttaaaagtg ctcatcattg gaaaacgttc ttcggggcga aaactctcaa 4980  
 ggatcttacc gctgttgaga tccagttcga tgtaaccac tcgtgcaccc aactgatctt 5040  
 cagcatcttt tactttcacc agcgtttctg ggtgagcaaa aacaggaagg caaaatgccg 5100  
 caaaaaaggg aataaggcg acacggaaat gttgaatact catactcttc ctttttcaat 5160  
 attattgaag catcttatcag ggttattgtc tcatgagcgg atacatattt gaatgtattt 5220  
 agaaaaataa acaaataggg gttccgcgca catttccccg aaaagtgcc cctgacgcgc 5280  
 cctgtagcgg cgcatthaag gcggcgggtg tgggtgttac gcgcagcgtg accgctacac 5340  
 ttgccagcgc cctagcgcgc gctcctttcg ctttcttccc ttcctttctc gccacgttcg 5400

ccggctttcc ccgtcaagct ctaaatacggg ggctcccttt agggttccga tttagtgcct 5460  
 tacggcacct cgaccccaaa aaacttgatt agggatgatgg ttcacgtagt gggccatcgc 5520  
 cctgatagac ggtttttcgc ctttgacgt tggagtccac gttctttaat agtggactct 5580  
 tgttccaaac tggaacaaca ctcaacccta tctcgggtcta ttcttttgat ttataaggga 5640  
 ttttgccgat ttcggcctat tggttaaaaa atgagctgat ttaacaaaaa tttaacgcga 5700  
 attttaacaa aatattaacg cttacaattt ac 5732

<210> 2  
 <211> 228  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Synthetic Sequence

<400> 2

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
 1 5 10 15

Gly Ser Thr Gly Asp Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ala  
 20 25 30

Gln Lys Pro Glu Val Ile Asp Ala Ser Glu Leu Thr Pro Ala Val Thr  
 35 40 45

Thr Tyr Lys Leu Val Ile Asn Gly Lys Thr Leu Lys Gly Glu Thr Thr  
 50 55 60

Thr Glu Ala Val Asp Ala Ala Thr Ala Glu Lys Val Phe Lys Gln Tyr  
 65 70 75 80

Ala Asn Asp Asn Gly Val Asp Gly Glu Trp Thr Tyr Asp Asp Ala Thr  
 85 90 95

Lys Thr Phe Thr Val Thr Glu Lys Pro Glu Val Ile Asp Ala Ser Glu  
 100 105 110

Leu Thr Pro Ala Val Thr Thr Tyr Lys Leu Val Ile Asn Gly Lys Thr  
 115 120 125

Leu Lys Gly Glu Thr Thr Thr Glu Ala Val Asp Ala Ala Thr Ala Glu  
 130 135 140

Lys Val Phe Lys Gln Tyr Ala Asn Asp Asn Gly Val Asp Gly Glu Trp  
 145 150 155 160

Thr Tyr Asp Asp Ala Thr Lys Thr Phe Thr Val Thr Glu Ala Ala Ala  
 165 170 175

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Gly Ala Val Asp Gly  
 180 185 190

Gln Asn Asp Thr Ser Gln Thr Ser Ser Pro Ser Ala Ser Ser Asn Ile  
 195 200 205

Ser Gly Gly Ile Phe Leu Phe Phe Val Ala Asn Ala Ile Ile His Leu  
 210 215 220

Phe Cys Phe Ser  
 225

<210> 3  
 <211> 6094  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic Sequence

<400> 3  
 gcgcgcgttg acattgatta ttgactagtt attaatagta atcaattacg gggtcattag 60  
 ttcatagccc atatatggag ttccgcgta cataacttac ggtaaattggc ccgcctggct 120  
 gaccgcccac cgacccccgc ccattgacgt caataatgac gtatgttccc atagtaacgc 180  
 caataggggac tttccattga cgtcaatggg tggactatgt acggtaaaact gccacttg 240  
 cagtacatca agtgtatcat atgccaagta cgtcccttat tgacgtcaat gacggtaa 300  
 ggcccgcctg gcattatgcc cagtacatga ctttatggga ctttctact tggcagtaca 360  
 tctacgtatt agtcatcgct attaccatgg tgatgcggtt ttggcagtac atcaatgggc 420  
 gtggatagcg gtttgactca cggggatttc caagtctcca cccattgac gtcaatggga 480  
 gtttgttttg gcacaaaaat caacgggact ttccaaaaatg tcgtaacaac tccgccccat 540  
 tgacgcaaat gggcggtagg cgtgtacggt gggagggtcta tataagcaga gctctctggc 600  
 taactagaga acccactgct tactggctta tcgaaattaa tacgactcac tatagggaga 660  
 cccaagcttg gtaccggtgc gatggcacc tgcatgctgc tcctgctgtt ggcggccgcc 720  
 ctggccccga ctcagaccgc cgcgggggcc caaaaggaga agacccccga ggagcccaag 780  
 gaggagggtga ccatcaaggc caacctgac tacgccgacg gcaagaccca gaccgccgag 840  
 ttcaagggca ctttcgagga ggccaccgcg gaggcctacc gctacgccga cgccctgaag 900  
 aaggacaacg gcgagtacac cgtggacgtg gccgacaagg gctacacctt gaacatcaag 960  
 ttcgcgggca aggagaagac ccccgaggag cccaaggagg aggtgacct caaggccaac 1020  
 ctgatctacg ccgacggcaa gaccagacc gccgagttca agggcacctt cgaggaggcc 1080  
 accgcggagg cctaccgcta cgcgcagccc ctgaagaagg acaacggcga gtacaccgtg 1140  
 gacgtggccg acaagggtta caccctgaac atcaagttcg ccggcaaggga gaagaccccc 1200  
 gaggagccca aggaggaggt gaccatcaag gccaacctga tctacgccga cggcaagacc 1260  
 cagaccgccg agttcaaggg cactttcgag gaggccaccg cggaggccta ccgctacgcc 1320  
 gacgccctga agaaggacaa cggcgagtac accgtggacg tggccgacaa gggctacacc 1380

ctgaacatca agttcgccgg caaggagaag acccccgagg agcccaagga ggaggtgacc 1440  
 atcaaggcca acctgatcta cgccgacggc aagaccaga ccgccgagtt caagggcacc 1500  
 ttcgaggagg ccaccgcgga ggcctaccgc tacgccgacg ccctgaagaa ggacaacggc 1560  
 gagtacaccg tggacgtggc cgacaagggc tacaccctga acatcaagtt cgccggcgcg 1620  
 gccgcagaac aaaaactcat ctcaagaag gatctgaatg gggccgtcga cggacaaaac 1680  
 gacaccagcc aaaccagcag cccctcagca tccagcaaca taagcggagg cattttcctt 1740  
 ttcttcgtgg ccaatgccat aatccacctc ttctgcttca gttgaggtga cacgtctaga 1800  
 gctattctat agtgtcacct aaatgctaga gctcgtgat cagcctcgac tgtgccttct 1860  
 agttgccagc catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaagggtgcc 1920  
 actcccactg tcctttccta ataaaatgag gaaattgcat cgattgtct gagtaggtgt 1980  
 cattctattc tgggggggtgg ggtggggcag gacagcaagg gggaggattg ggaagacaat 2040  
 agcaggcatg ctggggatgc ggtgggctct atggcttctg aggcggaaag aaccagtggc 2100  
 ggtaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg 2160  
 ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg 2220  
 cccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg 2280  
 actataaaga taccaggcgt tccccctgg aagctccctc gtgcgctctc ctgttccgac 2340  
 cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca 2400  
 tagctcacgc tgtaggtatc tcagttcggg ttaggtcgtt cgctccaagc tgggctgtgt 2460  
 gcacgaacc cccgttcagc ccgaccgtg cgccttatcc ggtaactatc gtcttgagtc 2520  
 caaccggta agacacgact tatcgccact ggcagcagcc actggtaaca ggattagcag 2580  
 agcagggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac 2640  
 tagaaggaca gtatttggtg tctgcgtctt gctgaagcca gttaccttcg gaaaaagagt 2700  
 tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa 2760  
 gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct tttctacggg 2820  
 gtctgacgct cagtggaaacg aaaactcacg ttaagggatt ttggtcatga gattatcaaa 2880  
 aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat 2940  
 atatgagtaa cctgaggcta tggcagggcc tgccgccccg acgttggtg cgagccctgg 3000  
 gccttcaccc gaacttgggg ggtgggggtg ggaaaaggaa gaaacgcggg cgtattggcc 3060  
 ccaatggggt ctcggtgggg tatcgacaga gtgccagccc tgggaccgaa ccccgcgttt 3120  
 atgaacaaac gacccaacac cgtgcgtttt attctgtctt ttattgccc tcatagcgcg 3180  
 ggttccttcc ggtattgtct ccttccgtgt ttcagttagc ctccccctag ggtgggcgaa 3240  
 gaactccagc atgagatccc cgcgctggag gatcatccag ccgcggtccc ggaaaacgat 3300  
 tccgaagccc aacctttcat agaaggcggc ggtggaatcg aaatctcgtg atggcaggtt 3360  
 gggcgtcgtt tggtcgttca tttcgaaccc cagagtcctc ctcagaagaa ctcgtcaaga 3420  
 aggcgataga aggcgatgcg ctgcgaatcg ggagcggcga taccgtaaag cacgaggaag 3480

cggtcagccc attcgccgcc aagctcttca gcaatatcac gggtagccaa cgctatgtcc 3540  
 tgatagcggc ccgccacacc cagccggcca cagtcgatga atccagaaaa gcggccattt 3600  
 tccaccatga tattcgccaa gcaggcatcg ccatgggtca cgacgagatc ctgcccgtcg 3660  
 ggcattgctc ccttgagcct ggcgaacagt tcggctggcg cgagcccctg atgctcttga 3720  
 tcacctgat cgacaagacc ggcttccatc cgagtacgtg ctgctcgat gcgatgtttc 3780  
 gcttggtggt cgaatgggca ggtagccgga tcaagcgtat gcagccgccg cattgcatca 3840  
 gccatgatgg atactttctc ggcaggagca aggtgagatg acaggagatc ctgccccggc 3900  
 acttcgcccc atagcagcca gtcccttccc gcttcagtga caacgtcgag cacagctcg 3960  
 caaggaacgc ccgtcgtggc cagccacgat agccgcgtg cctcgtcttg cagttcattc 4020  
 agggcaccgg acaggtcggc cttgacaaaa agaaccgggc gccctgcgc tgacagccgg 4080  
 aacacggcgg catcagagca gccgattgtc tgttggtgcc agtcatagcc gaatagcctc 4140  
 tccaccaag cgccgggaga acctgcgtgc aatccatctt gttcaatcat gcgaaacgat 4200  
 cctcatcctg tctcttgatc gatctttgca aaagcctagg cctccaaaaa agcctctca 4260  
 ctacttctgg aatagctcag aggccgagga ggcggcctcg gcctctgcat aaataaaaaa 4320  
 aattagtcag ccatggggcg gagaatgggc ggaactgggc ggagttaggg gcgggatggg 4380  
 cggtgtagg ggcgggacta tgggtgctga ctaattgaga tgcattgtt gcatacttct 4440  
 gcctgctggg gagcctggg actttccaca cctggttgct gactaattga gatgcatgct 4500  
 ttgcatactt ctgcctgctg gggagcctgg ggactttcca caccctaact gacacacatt 4560  
 ccacagctgg ttctttccgc ctccagactc ttctttttc aataaatcaa tctaaagtat 4620  
 atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc 4680  
 gatctgtcta ttctgtcat ccatagttgc ctgactcccc gtcgtgtaga taactacgat 4740  
 acgggagggc ttaccatctg gccccagtgc tgcaatgata ccgcgagacc cacgctcacc 4800  
 ggctccagat ttatcagcaa taaaccagcc agccggaagg gccgagcgca gaagtgttcc 4860  
 tgcaacttta tccgcctcca tccagtctat taattgttgc cgggaagcta gagtaagtag 4920  
 ttcgccagtt aatagtttgc gcaacgttgt tgccattgct acaggcatcg tgggtgtcacg 4980  
 ctgctgctt ggtatggctt cattcagctc cggttcccaa cgatcaaggc gagttacatg 5040  
 atcccccatg ttgtgcaaaa aagcggttag ctcttcggt cctccgatcg ttgtcagaag 5100  
 taagtgggcc gcagtgttat cactcatggt tatggcagca ctgcataatt ctcttactgt 5160  
 catgccatcc gtaagatgct tttctgtgac tggtagtac tcaaccaagt cattctgaga 5220  
 atagtgtatg cggcgaccga gttgctcttg cccggcgtca atacgggata ataccgcgcc 5280  
 acatagcaga actttaaaag tgctcatcat tggaaaacgt tcttcggggc gaaaactctc 5340  
 aaggatctta ccgctgttga gatccagttc gatgtaacc actcgtgcac ccaactgatc 5400  
 ttcagcatct ttactttca ccagcgtttc tgggtgagca aaaacaggaa ggcaaatgc 5460  
 cgcaaaaaag ggaataaggg cgacacggaa atgttgaata ctcatactct tcctttttca 5520

```

atattattga agcatttatc aggggttattg tctcatgagc ggatacatat ttgaatgtat 5580
ttagaaaaat aaacaaatag ggggtccgcg cacatttccc cgaaaagtgc cacctgacgc 5640
gccctgtagc ggcgcattaa gcgcggcggg tgtggtggtt acgcgcagcg tgaccgctac 5700
acttgccagc gccctagcgc ccgctccttt cgctttcttc ccttcctttc tcgccacgtt 5760
cgccggcttt ccccgtaag ctctaaatcg ggggctccct ttagggttcc gatttagtgc 5820
tttacggcac ctcgacccca aaaaacttga ttaggggtgat ggttcacgta gtgggccatc 5880
gccctgtagc acggtttttc gccctttgac gttggagtcc acgttcttta atagtggact 5940
cttggtccaa actggaacaa cactcaacc tatctcggtc tattcttttg atttataagg 6000
gattttgccg atttcggcct attggttaaa aaatgagctg atttaacaaa aatttaacgc 6060
gaattttaac aaaatattaa cgcttacaat ttac 6094

```

```

<210> 4
<211> 367
<212> PRT
<213> Artificial Sequence

```

```

<220>
<223> Synthetic Sequence

```

```

<400> 4

```

```

Met Ala Pro Cys Met Leu Leu Leu Leu Ala Ala Ala Leu Ala Pro
1          5          10         15

```

```

Thr Gln Thr Arg Ala Gly Ala Gln Lys Glu Lys Thr Pro Glu Glu Pro
          20         25         30

```

```

Lys Glu Glu Val Thr Ile Lys Ala Asn Leu Ile Tyr Ala Asp Gly Lys
          35         40         45

```

```

Thr Gln Thr Ala Glu Phe Lys Gly Thr Phe Glu Glu Ala Thr Ala Glu
          50         55         60

```

```

Ala Tyr Arg Tyr Ala Asp Ala Leu Lys Lys Asp Asn Gly Glu Tyr Thr
          65         70         75         80

```

```

Val Asp Val Ala Asp Lys Gly Tyr Thr Leu Asn Ile Lys Phe Ala Gly
          85         90         95

```

```

Lys Glu Lys Thr Pro Glu Glu Pro Lys Glu Glu Val Thr Ile Lys Ala
          100        105        110

```

```

Asn Leu Ile Tyr Ala Asp Gly Lys Thr Gln Thr Ala Glu Phe Lys Gly
          115        120        125

```

```

Thr Phe Glu Glu Ala Thr Ala Glu Ala Tyr Arg Tyr Ala Asp Ala Leu
          130        135        140

```

```

Lys Lys Asp Asn Gly Glu Tyr Thr Val Asp Val Ala Asp Lys Gly Tyr
          145        150        155        160

```



Thr Leu Asn Ile Lys Phe Ala Gly Lys Glu Lys Thr Pro Glu Glu Pro  
 165 170 175

Lys Glu Glu Val Thr Ile Lys Ala Asn Leu Ile Tyr Ala Asp Gly Lys  
 180 185 190

Thr Gln Thr Ala Glu Phe Lys Gly Thr Phe Glu Glu Ala Thr Ala Glu  
 195 200 205

Ala Tyr Arg Tyr Ala Asp Ala Leu Lys Lys Asp Asn Gly Glu Tyr Thr  
 210 215 220

Val Asp Val Ala Asp Lys Gly Tyr Thr Leu Asn Ile Lys Phe Ala Gly  
 225 230 235 240

Lys Glu Lys Thr Pro Glu Glu Pro Lys Glu Glu Val Thr Ile Lys Ala  
 245 250 255

Asn Leu Ile Tyr Ala Asp Gly Lys Thr Gln Thr Ala Glu Phe Lys Gly  
 260 265 270

Thr Phe Glu Glu Ala Thr Ala Glu Ala Tyr Arg Tyr Ala Asp Ala Leu  
 275 280 285

Lys Lys Asp Asn Gly Glu Tyr Thr Val Asp Val Ala Asp Lys Gly Tyr  
 290 295 300

Thr Leu Asn Ile Lys Phe Ala Gly Ala Ala Ala Glu Gln Lys Leu Ile  
 305 310 315 320

Ser Glu Glu Asp Leu Asn Gly Ala Val Asp Gly Gln Asn Asp Thr Ser  
 325 330 335

Gln Thr Ser Ser Pro Ser Ala Ser Ser Asn Ile Ser Gly Gly Ile Phe  
 340 345 350

Leu Phe Phe Val Ala Asn Ala Ile Ile His Leu Phe Cys Phe Ser  
 355 360 365

<210> 5  
 <211> 5729  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic Sequence

<400> 5  
 gcgcgcgttg acattgatta ttgactagtt attaatagta atcaattacg gggtcattag 60  
 ttcatagccc atatatggag ttccgcgtta cataacttac ggtaaatggc ccgcctggct 120  
 gaccgcccaa cgacccccgc ccattgacgt caataatgac gtatgttccc atagtaacgc 180

caatagggac tttccattga cgtcaatggg tggactatgt acggtaaaact gccactttgg 240  
 cagtacatca agtgtatcat atgccaagta cgtcccttat tgacgtcaat gacggtaaat 300  
 ggcccgctg gcattatgcc cagtacatga ctttatggga ctttcctact tggcagtaca 360  
 tctacgtatt agtcatcgct attaccatgg tgatgcggtt ttggcagtac atcaatgggc 420  
 gtggatagcg gtttgactca cggggatttc caagtctcca cccatttgac gtcaatggga 480  
 gtttgttttg gcacaaaaat caacgggact ttccaaaatg tcgtaacaac tccgccccat 540  
 tgacgcaaat gggcggtagg cgtgtacggt gggaggtcta tataagcaga gctctctggc 600  
 taactagaga acccactgct tactggctta tcgaaattaa tacgactcac tatagggaga 660  
 cccaagcttg gtaccggtgc gatggcacc cgcgtgctgc tcctgctgtt ggcgcccgcc 720  
 ctggccccga ctcagaccgg cgcggggggc caaaagcccg aggtgatcga tgccagcgag 780  
 ctgacccccg ccgtgaccac ctacaagcta gtgatcaacg gcaagaccct gaagggcgag 840  
 accaccaccg aggccgtgga cgcggccacc gcggagaagg tgttcaaaca atacgctaata 900  
 gacaacgggg tcgacggcga gtggacttac gacgacgcca ccaagaccct caccgtgacc 960  
 gagaagcccg aggtgatcga tgccagcgag ctgacccccg ccgtgaccac ctacaagcta 1020  
 gtgatcaacg gcaagaccct gaagggcgag accaccaccg aggccgtgga cgcggccacc 1080  
 gcggagaagg tgttcaaaca atacgctaata gacaacgggg tcgacggcga gtggacttac 1140  
 gacgacgcca ccaagaccct caccgtgacc gaggcggcgg cagaacaaa actcatctca 1200  
 gaagaggatc tgaatggggc cgtcgacgaa caaaaactca tctcagaaga ggatctgaat 1260  
 gctgtggggc aggacacgca ggaggtcatc gtggtgccac actccttgcc cttaaggtg 1320  
 gtggtgatct cagccatcct ggccctgggtg gtgctacca tcctctccct tatcatctc 1380  
 atcatgcttt ggcagaagaa gccacgttcg tcggccgacg gagaatccat cttagagctat 1440  
 tctatagtgt cacctaaatg cttagagctc ctgatcagcc tcgactgtgc cttctagtgt 1500  
 ccagccatct gttgtttgcc cctccccgt gccttccttg accctggaag gtgccactcc 1560  
 cactgtcctt tcctaataaa atgaggaaat tgcacgcat tgtctgagta ggtgtcattc 1620  
 tattctgggg ggtgggggtg ggcaggacag caagggggag gattgggaag acaatagcag 1680  
 gcatgctggg gatgcggtgg gctctatggc ttctgaggcg gaaagaacca gtggcggtaa 1740  
 tacggttatc cacagaatca ggggataacg caggaaagaa catgtgagca aaaggccagc 1800  
 aaaaggccag gaaccgtaaa aaggccgcgt tgctggcggt tttccatagg ctccgcccc 1860  
 ctgacgagca tcacaaaaat cgacgtctaa gtcagagggt gcgaaacccg acaggactat 1920  
 aaagatacca ggcgtttccc cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc 1980  
 cgcttacccg atacctgtcc gcctttctcc cttcgggaag cgtggcgctt tctcatagct 2040  
 cagctgttag gtatctcagt tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg 2100  
 aacccccgt tcagcccgac cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc 2160  
 cggtaagaca cgacttatcg ccactggcag cagccactgg taacaggatt agcagagcga 2220  
 ggtatgtagg cgggtctaca gagttcttga agtgggtggc taactacggc tacactagaa 2280

ggacagtatt tggatatctgc gctctgctga agccagttac cttcgaaaa agagttggtgta 2340  
 gctcttgatc cggaacaa accaccgctg gtagcgggtg tttttttgtt tgcaagcagc 2400  
 agattacgag cagaaaaaaa ggatctcaag aagatccttt gatcttttct acgggggtctg 2460  
 acgctcagtg gaacgaaaac tcacgttaag ggatttttgt catgagatta tcaaaaagga 2520  
 tcttcaccta gatcctttta aattaaaaat gaagttttta atcaatctaa agtatatatg 2580  
 agtaacctga ggctatggca gggcctgccc ccccgacgtt ggctgagagc cctgggacctt 2640  
 caccggaact tgggggggtg ggtggggaaa aggaagaaac gcgggcgtat tggccccaat 2700  
 ggggtctcgg tgggggtatc acagagtgcc agccctggga ccgaaccccg cgtttatgaa 2760  
 caaacgacct aacaccgtgc gttttattct gtctttttat tgccgtcata gcgcgggttc 2820  
 cttccggtat tgtctccttc cgtgtttcag ttagcctccc cctaggggtg gcgaagaact 2880  
 ccagcatgag atccccgcgc tggaggatca tccagccggc gtcccggaaa acgattccga 2940  
 agcccaacct ttcatagaag gcggcgggtg aatcgaaatc tcgtgatggc aggttgggagc 3000  
 tcgcttggtc ggtcatttcg aaccccgag tcccgctcag aagaactcgt caagaaggcg 3060  
 atagaaggcg atgcgctgag aatcgggagc ggcgataccg taaagcacga ggaagcggtc 3120  
 agcccatcgc ccgccaagct cttcagcaat atcacgggta gccaacgcta tgcctgata 3180  
 gcggtccgcc acaccagcc ggccacagtc gatgaatcca gaaaagcggc cttttccac 3240  
 catgatattc ggcaagcagg catcgccatg ggtcacgagc agatcctcgc cgtcgggcat 3300  
 gctcgccttg agcctggcga acagttcggc tggcgcgagc ccctgatgct cttgatcatc 3360  
 ctgatcgaca agaccggctt ccattccgag acgtgctcgc tcgatgcgat gtttcgcttg 3420  
 gtggtcgaat gggcaggtag ccggatcaag cgtatgcagc cgcgcattg catcagccat 3480  
 gatggatact ttctcggcag gagcaagggt agatgacagg agatcctgcc ccggcacttc 3540  
 gcccaatagc agccagtccc ttcccgttc agtgacaacg tcgagcacag ctgcgcaagg 3600  
 aacgcccgtc gtggccagcc acgatagccg cgctgcctcg tcttgagtt cattcagggc 3660  
 accggacagg tcggtcttga caaaaagaac cgggcgccc tcgctgaca gccggaacac 3720  
 ggcggcatca gagcagccga ttgtctgttg tgcccagtca tagccgaata gcctctccac 3780  
 ccaagcggcc ggagaacctg cgtgcaatcc atcttgttca atcatgcgaa acgatcctca 3840  
 tcctgtctct tgatgatctt ttgcaaaagc ctaggcctcc aaaaaagcct cctcactact 3900  
 tctggaatag ctacagaggc gaggagcggt cctcggcctc tgcataaata aaaaaatta 3960  
 gtcagccatg gggcggagaa tgggcggaac tgggcggagt taggggcggg atgggcggag 4020  
 ttagggcggt gactatggtt gctgactaat tgagatgcat gctttgcata cttctgcctg 4080  
 ctggggagcc tggggacttt ccacacctgg ttgtgacta-attgagatgc atgctttgca 4140  
 tacttctgcc tgctggggag cctggggact ttccacacc taactgacac acattccaca 4200  
 gctggttctt tccgcctcag gactcttctt ttttcaataa atcaatctaa agtatatatg 4260  
 agtaaacctg gtctgacagt taccaatgct taatcagtga ggcacctatc tcagcgatct 4320

```

gtctatttcg ttcatccata gttgcctgac tccccgctgt gtagataact acgatacggg 4380
agggcttacc atctggcccc agtgctgcaa tgataccgcg agaccacgc tcaccggctc 4440
cagatttata agcaataaac cagccagccg gaagggccga gcgcagaagt ggtcctgcaa 4500
ctttatccgc ctccatccag tctattaatt gttgccggga agctagagta agtagttcgc 4560
cagttaatag tttgcgcaac gttgttgcca ttgtacagg catcgtggtg tcacgctcgt 4620
cgtttggtat ggcttcattc agtccgggtt cccaacgata aaggcgagtt acatgatccc 4680
ccatgttggtg caaaaagcg gttagctcct tcggtcctcc gatcgttgtc agaagtaagt 4740
tggccgcagt gttatcactc atgggtatgg cagcactgca taattctctt actgtcatgc 4800
catccgtaag atgcttttct gtgactggtg agtactcaac caagtcattc tgagaatagt 4860
gtatgcggcg accgagttgc tcttgcccg cgtaatacg ggataatacc gcgccacata 4920
gcagaacttt aaaagtgtc atcattggaa aacgttcttc ggggcgaaaa ctctcaagga 4980
tcttaccgct gttgagatcc agttcgatgt aaccactcg tgcacccaac tgatcttcag 5040
catcttttac tttcaccagc gtttctgggt gagcaaaaac aggaaggcaa aatgccgcaa 5100
aaaaggggat aagggcgaca cggaaatgtt gaatactcat actcttctt tttcaatatt 5160
attgaagcat ttatcaggtt tattgtctca tgagcggata catatttgaa tgtatttaga 5220
aaaataaaca aataggggtt ccgcgcatat tccccgaaa agtgccacct gacgcgccct 5280
gtagcggcgc attaacgcg gcgggtgtgg tggttacg cgcggtgacc gctacacttg 5340
ccagcgccct agcggccgct cctttcgctt tcttcccttc ctttctcgcc acgttcgccg 5400
gctttccccg tcaagctcta aatcgggggc tcccttagg gttccgattt agtgctttac 5460
ggcacctcga ccccaaaaaa cttgattagg gtgatggttc acgtagtggg ccatcgccct 5520
gatagacggt ttttcgccct ttgacgttgg agtccacgtt ctttaatagt ggactcttgt 5580
tccaaactgg aacaacactc aaccctatct cggcttattc ttttgattta taagggattt 5640
tgccgatttc ggcctattgg ttaaaaaatg agctgattta acaaaaattt aacgcgaatt 5700
ttaacaaaat attaacgctt acaatttac 5729

```

<210> 6  
 <211> 250  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Synthetic Sequence

<400> 6

Met Ala Pro Cys Met Leu Leu Leu Leu Ala Ala Ala Leu Ala Pro  
 1 5 10 15

Thr Gln Thr Arg Ala Gly Ala Gln Lys Pro Glu Val Ile Asp Ala Ser  
 20 25 30

Glu Leu Thr Pro Ala Val Thr Tyr Lys Leu Val Ile Asn Gly Lys  
 35 40 45

Thr Leu Lys Gly Glu Thr Thr Thr Glu Ala Val Asp Ala Ala Thr Ala  
 50 55 60  
 Glu Lys Val Phe Lys Gln Tyr Ala Asn Asp Asn Gly Val Asp Gly Glu  
 65 70 75 80  
 Trp Thr Tyr Asp Asp Ala Thr Lys Thr Phe Thr Val Thr Glu Lys Pro  
 85 90 95  
 Glu Val Ile Asp Ala Ser Glu Leu Thr Pro Ala Val Thr Thr Tyr Lys  
 100 105 110  
 Leu Val Ile Asn Gly Lys Thr Leu Lys Gly Glu Thr Thr Thr Glu Ala  
 115 120 125  
 Val Asp Ala Ala Thr Ala Glu Lys Val Phe Lys Gln Tyr Ala Asn Asp  
 130 135 140  
 Asn Gly Val Asp Gly Glu Trp Thr Tyr Asp Asp Ala Thr Lys Thr Phe  
 145 150 155 160  
 Thr Val Thr Glu Ala Ala Ala Glu Gln Lys Leu Ile Ser Glu Glu Asp  
 165 170 175  
 Leu Asn Gly Ala Val Asp Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu  
 180 185 190  
 Asn Ala Val Gly Gln Asp Thr Gln Glu Val Ile Val Val Pro His Ser  
 195 200 205  
 Leu Pro Phe Lys Val Val Val Ile Ser Ala Ile Leu Ala Leu Val Val  
 210 215 220  
 Leu Thr Ile Ile Ser Leu Ile Ile Leu Ile Met Leu Trp Gln Lys Lys  
 225 230 235 240  
 Pro Arg Ser Ser Ala Asp Arg Glu Ser Ile  
 245 250